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| ***Standards*** | **Category Percent** |
| **Physical Science** |  |
| 6.P.1 | 13% to 17% |
| 6.P.2 | 16 % to 22% |
| 6.P.3 | 7% to 11% |
| **Earth Science** |  |
| 6.E.1 | 9% to 14% |
| 6.E.2 | 16% to 20% |
| **Life Science** |  |
| 6.L.1 | 2% to 8% |
| 6.L.2 | 10% to 16% |

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|  | **Subject: Science**  **Grade Level: 6th**  **Unit Title: Energy and Motion “Catch A Wave”** | | **Time frame Needed for Completion:** | | |
| **“Catch a Wave”**  **Unit 1** | ***Domain(s): Physical Science- Energy and Matter***  ***Priority Standard(s):***  ***6.P.1 Understand the properties of waves and the wavelike properties of energy in earthquakes, light and sound.***   |  | | --- | | **6.P.1.1** Compare the properties of waves to the wavelike property of energy in earthquakes, light and sound.  **6.P.1.2** Explain the relationship among visible light, the electromagnetic spectrum, and sight.  **6.P.1.3** Explain the relationship among the rate of vibration, the medium through which vibrations travel, sound and hearing.  ***6.P.3* Understand characteristics of energy transfer and interactions of matter and energy.** |   **6.P.3.1** Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.  **6.P.3.2** Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.  **6.P.3.3** Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).  ***Supporting Standard(s):***  ***3.P.3* Recognize how energy can be transferred from one object to another.**  **3.P.3.1** Recognize that energy can be transferred from one object to another by rubbing them against each other.  **3.P.3.2** Recognize that energy can be transferred from a warmer object to a cooler one by contact or at a distance and the cooler object gets warmer.  **4.P.3 Recognize that energy takes various forms that may be grouped based on their interaction with matter.**  **4.P.3.1** Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.  **4.P.3.2** Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.  **5.P.3 Explain how the properties of some materials change as a result of heating and cooling.**  **5.P.3.1** Explain the effects of the transfer of heat (either by direct contact or at a distance) that occurs between objects at different temperatures. (conduction, convection or radiation) | | | | |
| **Essential Question(s):**   * How is the amount of destruction different in p-waves and s-waves? * How energy is transferred though convection, conduction and radiation? * What are the effects of electromagnetic waves on various materials? (absorption, scattering and change in temperature) * How can you explain the relationship between frequency, pitch, amplitude and loudness? * What is the relationship between visible light, the electromagnetic spectrum and sight? * How does the speed of vibration, material which it travels through affect what you hear? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| seismic waves  light energy  sound energy  energy  waves  medium  transverse wave  longitudinal wave  amplitude  wavelength  frequency  wave speed  electromagnetic spectrum  electromagnetic radiation  light energy  absorption  scattering reflection  refraction | medium  sound wave  vibration  heat,  conduction,  radiation,  convection,  thermal energy,  equilibrium,  electromagnetic waves  absorption,  scattering,  refraction,  reflection,  expansion  contraction  conductor  insulator | * Analyze (Analysis) * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Hypothesize (Hypothesis) * Predict (Prediction) * System * Theory * Law * Constant * Variable (independent and dependent) * Control * Constant * Relationship | * Interpret * Model * Represent * Describe * Effect * Explain * Balance |
| **Recommended Resources:**  **DPI website:** [**www.ncpublicschools.org**](http://www.ncpublicschools.org)  AVID: Write Path-Science  NCDPI Indicators  Brain POP  Instructional Resources  ClassScape  <http://www.thinkfinity.org>  <http://www.curriki.org>  <http://www.readwritethink.org/index.asp>  <http://streaming.discoveryeducation.com/>  <http://digitalgallery.nypl.org/nypldigital/index.cfm>  <http://betterlesson.org/>  <http://www.smithsonianchannel.com/site/sn/home.do>  <http://www.nysedregents.org/grade8/science/home.html>  <http://www.corestandards.org/the-standards/english-language-arts-standards/science-technical/grades-6-8/> | | | | |
|  | **Recommended for the Unit:**   * [Animation of earthquake waves](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1002/es1002page01.cfm) * [Animation of P and S waves](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1009/es1009page01.cfm?chapter_no=visualization) \*\*\* Excellent site for wave motion. It explains the difference in p-waves and s-waves. But it also shows how layers of earth were determined. * AIMS: *Earth Book:* Quake Quest * [Earthquakes for kids](http://earthquake.usgs.gov/learn/kids/)   [Interactive sound site](http://library.thinkquest.org/19537/)   * [Electromagnetic spectrum](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT05/CT05.html) * [Visible light waves](http://science.hq.nasa.gov/kids/imagers/ems/visible.html) * [How vision works](http://health.howstuffworks.com/human-body/systems/eye/eye.htm) * [Parts of the eye and their function](http://faculty.washington.edu/chudler/eyetr.html) * [Parts of the eye printable](http://www.teachervision.fen.com/eyes/printable/43145.html) * [Virtual cow eye dissection](http://www.exploratorium.edu/learning_studio/cow_eye/)   [Roy G. Biv video](http://www.youtube.com/watch?v=Gf33ueRXMzQ)   * Paper cup phones * Holt visual concepts, [parts of the ear:](http://my.hrw.com/sh/ht56nc/0030304563/student/ch16/sec01/qc02/ht56nc16_01_q02fs.htm)   [Label the ear diagram](http://www.enchantedlearning.com/subjects/anatomy/ear/label/label.shtml)   * Holt visual concept, Conduction, Convection, Radiation: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch14/sec02/qc06/ht56nc14_02_q06fs.htm>   Holt Visual Concept, Thermal Equilibrium: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch14/sec02/qc05/ht56nc14_02_q05fs.htm>   * Visual Concepts, Law of Reflection: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch15/sec03/qc01/ht56nc15_03_q01fs.htm> * Visual Concept, Refraction: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch15/sec03/qc02/ht56nc15_03_q02fs.htm> * Visual Concept, Scattering: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch17/sec02/qc04/ht56nc17_02_q04fs.htm>   Electromagnetic waves <http://missionscience.nasa.gov/ems/01_intro.html>   * Prentice Hall text Visual Concept, Thermal Expansion: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch14/sec01/qc02/ht56nc14_01_q02fs.htm> | | | | |

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|  | **Subject: Science**  **Grade Level:**  **Unit Title: “What’s the Matter”** | | | **Time frame Needed for Completion:** | |
| **“What’s the Matter “**  **Unit 2** | ***Domain(s): Chemistry***  ***Priority Standard(s):***  ***6.P.2 Understand the structure, classifications and physical properties of matter.***  ***6.P.2.1 Recognize that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.***  ***6.P.2.2 Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase.***  ***6.P.2.3 Compare the physical properties of pure substances that are independent of the amount of matter present including density, boiling point, melting point and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.*** | | | | |
| **Essential Question(s):**   * What is matter and how does it behave? * How is the motion of atoms related to thermal energy? * What happened to atoms during changes in state of matter? * How does change in temperature affect motion? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| atom  element  matter  solid  liquid  gas  volume  molecules | physical properties, chemical properties, density,  boiling point, melting point, solubility,  solute,  solvent,  mass,  volume,  freezing | * Analyze (Analysis) * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Hypothesize (Hypothesis) * Predict (Prediction) * System * Theory * Law * Constant | | * Interpret * Model * Represent * Describe * Effect * Explain * Balance * Constant * Relationship * Variable (independent and dependent) * Control |
| **Resources for the Unit:**   * Chemistry Matters -- AIMS   + Oh Dear What Can this Matter Be?   + Marvelous Matter   + It is a matter of Stuff and Space   + Solid, Liquids, and Gases, Oh Why?   + Kool Kups   + Change Matters   + It’s Elemental, My Dear   + Change Matters * [Matter](http://www.hardin.k12.ky.us/res_techn/download/matter3.ppt)**, Shelee Clark** <http://jc-schools.net/PPTs-science.htm> * <http://sciencespot.net/Media/atomsfam.pdf> * Demonstration: Show how heat travels through cookie sheet   (set up two hot plates with a cookie sheet over them, place  chocolate chips in the middle of the sheet, between the hot plates). Discuss how heat travels through the pan.   * <http://www.chem4kids.com/files/matter_changes.html> * Quiz games for matter <http://www.neok12.com/States-of-Matter.htm>   Information on matter [http://idahoptv.org/dialogue4kids/season7/matter/facts.c](http://idahoptv.org/dialogue4kids/season7/matter/facts.cfm)om   * *Mr. Archimedes’ Bath* By Pamela Allen * Density Lab from Science House * To Float or not to Float -- Different fruits to determine whether they will float or not * Have students create a clay boat to determine the largest number of “people” that can be put in the boat without sinking. * Video Clip: GI Joe Iceberg Sinking scene * Several different topics and activities about physical properties (along with other topics) * Boiling Water * Goldilocks and the Three Bears –Heat Transfer * Hot Can, Cold Can Lab   <http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_TRANSITIONMAIN&node_id=878&use_sec=false&sec_url_var=region1&__uuid=8d34599c-f5f4-4102-93ce-90fd47283e99> | | | | |

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|  | **Subject: Science**  **Grade Level:**  **Unit Title: Land Beneath Our Feet** | | **Time frame Needed for Completion:** | | |
| **Land Beneath Our Feet**  **Unit 3** | ***Domain(s): Lithosphere, Cycling, Soil, Rocks***  ***Priority Standard(s):***  ***6.E.2 Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans.***  ***6.E.2.1 Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.***  ***6.E.2.2 Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.***  ***6.E.2.3 Explain how the formation of soil is related to the parent rock type and the environment in which it develops.***  ***6.E.2.4 Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.*** | | | | |
| **Essential Question(s):**   * What are the characteristics of the layers of the earth? * What can farmers do to ensure success with their crops? * How does parent rock and climate affect the soil? * What are plate tectonics and how do they affect the earth? * What are the layers of the Earth and how does their composition affect their density? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| crust  mantle  outer core  inner core  Mineral  Element  Compound  Rock  Rock cycle  Magma  Igneous rock  Sedimentary rock  Metamorphic rock  Weathering  Erosion  Deposition | Plate Tectonics  Tectonic Plates  Continental Drift  Lithosphere  Ocean Basin  Seafloor Spreading  Convergent boundary  Divergent boundary  Transformed boundary  Subduction boundary  Seismology  soil conservation  crop rotation | * Analyze (Analysis) * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Hypothesize (Hypothesis) * Predict (Prediction) * System * Theory * Law * Constant * Variable (independent and dependent) * Control | * Interpret * Model * Represent * Describe * Effect * Explain * Balance * Constant * Relationship |
| **Recommended Resources:**   * Journey to the Center of the Earth Jules Verne <http://jv.gilead.org.il/vt/c_earth/> * JCE Teacher Guide <http://www.walden.com/guide/journey_to_the_center_of_the_earth/> * [Animation on how seismic waves show Earth’s layers](http://aspire.cosmic-ray.org/labs/seismic/index.htm). * Creation of Layers of the earth model * Soil texture Lab * <http://www.windows2universe.org/teacher_resources/teach_snacktectonics.html> * <http://school.discoveryeducation.com/schooladventures/soil/teacher_tips.html> * Rock Collection Project * Learn Nc –Convection Currents, Keep the Heat | | | | |

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|  | **Subject: Science**  **Grade Level: 6th**  **Unit Title: “Growing & Flowing”** | | **Time frame Needed for Completion:** | | |
| **Growing & Flowing**  **Unit 4** | ***Domain(s): Environment, Life Science***  ***Priority Standard(s):***  ***6.L.1 Understand the structures, processes and behaviors of plants that enable them to survive and reproduce.***  ***6.L.1.1 Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.***  ***6.L.1.2 Explain the significance of the processes of photosynthesis, respiration and transpiration to the survival of green plants and other organisms.***  ***6.L.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.***  ***6.L.2.1 Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain or food web (terrestrial and aquatic) from producers to consumers to decomposers.***  ***6.L.2.2 Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an***  ***environment.***  ***6.L.2.3 Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.*** | | | | |
| **Essential Question(s):**   * Why are photosynthesis, respiration, and transpiration important to the survival of green plants and other organisms? * What are the basic structures and functions (survival, reproduction and defense) of flowering plants? * How do plants respond to external stimuli to survive? * How can you summarize the flow of energy and matter through an ecosystem? | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| Petal  Sepal  Stamen  Anther  Pistil  Ovary  Pollination  Fertilization  Photosynthesis  Respiration  Transpiration  Stomata  abiotic  biotic  biomes | Organism  Carbon dioxide  Oxygen  Nitrogen  Environment  Producer  Consumer  Decomposer  Food chain  Food web  Dormancy  Tropism  Germination | * Analyze (Analysis) * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Hypothesize (Hypothesis) * Predict (Prediction) * System * Theory * Law * Constant * Variable (independent and dependent) * Control | * Interpret * Model * Represent * Describe * Effect * Explain * Balance * Constant * Relationship |
| **Recommended Resources:**   * <http://www.google.com/url?q=http%3A%2F%2Fwww.theteachersguide.com%2Fplantsflowers.htm%23Plants%2FFlowers_Printouts&sa=D&sntz=1&usg=AFQjCNFj9Sfbt8iibi0lfPwx0006931dIQ> * ["Parts of a plant" powerpoint](http://www.google.com/url?q=http%3A%2F%2Fwww.theteachersguide.com%2Fplantsflowers.htm%23Plants%2FFlowers_Printouts&sa=D&sntz=1&usg=AFQjCNFj9Sfbt8iibi0lfPwx0006931dIQ) * [The biology of plants](http://www.google.com/url?q=http%3A%2F%2Fwww.mbgnet.net%2Fbioplants%2F&sa=D&sntz=1&usg=AFQjCNF-Fcs0B_LePt9x3R_EtFtWMB1WTQ)   AIMS book “The Budding Botanist”  <http://www.google.com/url?q=http%3A%2F%2Fwww.theteachersguide.com%2Fplantsflowers.htm%23Plants%2FFlowers_Printouts&sa=D&sntz=1&usg=AFQjCNFj9Sfbt8iibi0lfPwx0006931dIQ>   * **Visual** Concept, Photosynthesis: <http://my.hrw.com/sh/ht56nc/0030304563/student/ch19/sec03/qc01/ht56nc19_03_q01fs.htm>   AIMS book *Chemistry Matters*   * Block Busters * [What part of a plant do we eat?](http://serendip.brynmawr.edu/sci_edu/waldron/#planteaters) * [Energy through our lives](http://www.uwsp.edu/cnr/wcee/keep/Mod1/Flow/foodchains.htm) * [The flow of energy through plants and animals](http://www.ftexploring.com/me/me2.html) * <http://www.google.com/url?q=http%3A%2F%2F74.6.238.254%2Fsearch%2Fsrpcache%3Fei%3DUTF-8%26p%3Ddormancy%2Band%2Btropism%2Bfor%2Bkids%26fr%3Dyfp-t-701%26u%3Dhttp%3A%2F%2Fcc.bingj.com%2Fcache.aspx%3Fq%3Ddormancy%2Band%2Btropism%2Bfor%2Bkids%26d%3D4788716947050245%26mkt%3Den-US%26setlang%3Den-US%26w%3D9e436cf9%2Cf9ced91f%26icp%3D1%26.intl%3Dus%26sig%3D_9HCc3fvZ5JTt0JY5S6akg--&sa=D&sntz=1&usg=AFQjCNF8enuEfwIOCs2CLpWlMhZFvGSHEg> * <http://www.projects.juliantrubin.com/science_fair_project/botany/seed_germination_1.html> * [Which liquid germinates a seed the best?](http://www.projects.juliantrubin.com/science_fair_project/botany/seed_germination_1.html) * [Biomes](http://www.cotf.edu/ete/modules/msese/earthsysflr/biomes.html) * [Biome in a bottle](http://pbskids.org/zoom/activities/sci/biomeinabaggie.html) * [Dormancy and Tropism powerpoint](http://www.google.com/url?q=http%3A%2F%2F74.6.238.254%2Fsearch%2Fsrpcache%3Fei%3DUTF-8%26p%3Ddormancy%2Band%2Btropism%2Bfor%2Bkids%26fr%3Dyfp-t-701%26u%3Dhttp%3A%2F%2Fcc.bingj.com%2Fcache.aspx%3Fq%3Ddormancy%2Band%2Btropism%2Bfor%2Bkids%26d%3D4788716947050245%26mkt%3Den-US%26setlang%3Den-US%26w%3D9e436cf9%2Cf9ced91f%26icp%3D1%26.intl%3Dus%26sig%3D_9HCc3fvZ5JTt0JY5S6akg--&sa=D&sntz=1&usg=AFQjCNF8enuEfwIOCs2CLpWlMhZFvGSHEg) click *go to the current page* to get the powerpoint to open | | | | |

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|  | **Subject: Science**  **Grade Level: 6th**  **Unit Title: Space Invaders** | | **Time frame Needed for Completion:** | | |
| **Space Invaders**  **Unit 5** | ***Domain(s): Space, technology***  ***Priority Standard(s):***  ***6.E.1 Understand the earth/moon/sun system, and the properties, structures, and predictable motions of celestial bodies in the Universe.***  ***6.E.1.1 Explain how the relative motion and relative position of the sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses.***  ***6.E.1.2 Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun.***  ***6.E.1.3 Summarize space exploration and the understandings gained from them.*** | | | | |
| **Essential Question(s):**   * What is the effect of the sun and moon on the earth? * What are the benefits of space exploration? * How is the earth different from other planets? * How does earth sustain life? * How is knowledge gained from space exploration? * How does the position and motion of the sun-Earth moon system affect the seasons, tides, etc. | | | | |
| **Key Vocabulary:**  **(Content)** | | **Key Vocabulary:**  **(Academic)** | | |
| rotation  orbit  revolution  period of rotation  period of revolution  equinox  solstice  phase  eclipse  tide | planet  dwarf planet  natural satellite (moons),  asteroids  meteors  comets  composition  atmosphere  gravity  N.A.S.A.  telescope  International Space Station  light-year  galaxy  artificial satellite  space probe | * Analyze (Analysis) * Write * Fluent/Fluency * Distinguish comparisons * Flexible * Hypothesize (Hypothesis) * Predict (Prediction) * System * Theory * Law * Constant * Variable (independent and dependent) * Control | * Interpret * Model * Represent * Describe * Effect * Explain * Balance * Constant * Relationship |
| **Recommended Resources:**  AIMS -- *Out of this World*   * Dizzy Spells * It’s Apparent * Spin Cycle * Lunar Looking * Facing the Moon   Ranger Rick: *Astronomy*   * Moon Madness * Teacher Tube: [Phases of the Moon](http://www.teachertube.com/viewVideo.php?video_id=14461&title=Phases_of_the_Moon) * [Space education activities](http://www.astrosociety.org/education/activities/astroacts02.html#4) * [Astronomy education](http://cas.sdss.org/dr7/en/)   [Space education for young astronomers](http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html)  AIMS -- *Out of this World*   * Lining up the planets * Planetary Facts   Can You Planet?  AIMS -- *Out of this World*   * Extra -Terrrestrial Excursion * How Long Does it Take to Say Hello * [Astronomy education](http://www.faulkes-telescope.com/)   [Astronomy education](http://lcogt.net/)   * NCWISEOWL.ORG | | | | |